

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 24 AUG 2006

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Applicant's or agent's file reference 1456 (03-22)	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/US04/32830	International filing date (day/month/year) 06 October 2004 (06.10.2004)	Priority date (day/month/year) 20 October 2003 (20.10.2003)
International Patent Classification (IPC) or national classification and IPC IPC: A01B 29/00 (2006.01); B25F 5/02 (2006.01) USPC: 492/39,40,47,50		
Applicant VESUVIUS CRUCIBLE COMPANY		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:

- a. ☐ (sent to the applicant and to the International Bureau) a total of ___ sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
- b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

Date of submission of the demand 14 June 2005 (14.06.2005)	Date of completion of this report 03 August 2006 (03.08.2006)
Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer <i>For J. Liby</i> Marc Jimenez Telephone No. (571) 272-4530

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US04/32830

Box No. I Basis of the report1. With regard to the **language**, this report is based on:

- ☒ the international application in the language in which it was filed.
- ☐ a translation of the international application into English, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4(a))
- ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

- ☒ the international application as originally filed/furnished
- ☒ the description:
pages 1-10 as originally filed/furnished
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____
- ☒ the claims:
pages 11 and 12 as originally filed/furnished
pages* NONE as amended (together with any statement) under Article 19
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____
- ☒ the drawings:
pages 1/2-2/2 as originally filed/furnished
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US04/32830

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>2 and 10-14</u>	YES
	Claims <u>1 and 3-9</u>	NO
Inventive Step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-14</u>	NO
Industrial Applicability (IA)	Claims <u>1-14</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and Explanations (Rule 70.7)

Claims 1 and 3-9 lack novelty under PCT Article 33(2) as being anticipated by Ermenc et al. (US3456931).

Ermenc et al. teach a contacting segment (ceramic shell, col. 3, lines 28-33), comprising a low dusting millboard (col. 3, line 29), and a rigid segment (see the discs inside of the ceramic shell in figure) providing mechanical support for the contacting segment, comprising rigidized compressed fiber (col. 1, line 41 to col. 2, line 3, discs are made of fiber).

Regarding claim 3, the surface of the rigid portion (discs) is considered to be sealed by the ceramic shell.

Regarding claim 4, the rigid segment (discs) have a shoulder adjacent the contacting segment (ceramic shell).

Regarding claim 5, the end portion of the ceramic shell has an inclined 90 degree edge.

Regarding claims 6-7, the ends of the discs/ceramic shell are between at least two contacting/rigid segments (see figure for end supports). The claims are not specific as to whether the "at least two contacting segments" are the same as the contacting segment recited in claim 1. The claims are being read as there are two additional contacting/rigid segments.

Regarding claim 8, there are multiple discs which could be considered "at least two contacting segments". The end most segment in the figure that is screwed to the shaft are two additional rigid segments.

Regarding claim 9, the contacting segment (ceramic shell) has a larger external diameter than the rigid segment (discs).

Claim 2 lacks an inventive step under PCT Article 33(3) as being obvious over Ermenc et al. Ermenc et al. teach the invention cited above with the exception of having clay and mica in the millboard. However, official notice is taken that it was well known to a person of ordinary skill in the art to have provided millboard with clay and mica for its strength properties.

Claims 10-14 lack an inventive step under PCT Article 33(3) as being obvious over Ermenc et al. in view of Byung-Gie et al.

Ermenc et al. teach the invention cited above including end plates (see end elements attached to shaft in figure) with the exception of having at least one compression spring between the end plates and the roll cover. Byung-Gie et al. teach at least one compression spring (12) between an end plate and roll cover (2). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to have provided the invention of Ermenc et al. with at least one compression spring, in light of the teachings of Byung-Gie et al., in order to provide a compressive force to hold the roll cover in place. Note that the use of split rings is well known to a person of ordinary skill in the art, and official notice is taken that it would have been obvious to modify Ermenc et al./Byung-Gie et al. to include split rings for the purpose of providing a secure attachment.

Claims 1-14 meet the criteria set out in PCT Article 33(4), and thus meets industrial applicability because the subject matter claimed can be made or used in industry.